Bacillary White Diarrhoea

By Thomas Dalling

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HE question of poultry diseases was never so acute as it is to-day. The successful rearing of any stock must be governed to a large extent by an intimate knowledge of the diseases affect- it, because from such knowledge one is in a position to control reaks and to adopt measures for prevention and cure. Poultry ng has assumed large dimensions, and with the increase in the ber of birds kept, the disease rate has mounted up till at the ent time disease is increasing at an alarming rate especially ng large flocks in the country. As the industry on a commercial is comparatively new, it follows that many disease questions not been studied thoroughly, so that, although some knowledge been gained by the few investigators who have looked ahead made poultry diseases one of their studies, we are not in the same tion to deal with diseases of poultry as we are with relation to y diseases of human beings and other animals.

The position to-day is that fowl diseases are rampant, that many he best flocks in the country are seriously affected, possibly in cases without the owner's knowledge, and that disease is being ad broadcast because of our lack of knowledge of, or our indiffer- to, the methods by which such spread is taking place.

Of all the diseases affecting poultry in this country, Bacillary te Diarrhœa occupies the foremost position in severity. Much stigation has been carried out into its cause and prevention and, oily, much can now be done to prevent its spread and ultimately radicate it from a flock of breeding fowls. All poultry farmers read the various poultry journals must be familiar with the ortant points in connection with B.W.D. It may be useful, ever, to sum up the available knowledge under three heads :— cause, method of infection and spread ; (2) " carrier " hens and s, and (3) how to handle an outbreak.

ıse, method of Infection and Spread.

The cause of B.W.D. was shown, by Rettger and Harvey work- in America in 1908, to be a minute organism or germ which has n named Bacillus pullorum. Since the actual cause was overed many investigators in America and in this country have lied B.W.D. so that at the present time we are well acquainted the salient features of the organism and how it infects chicks. affected chicks do not die—some may recover : unfortunately n a disease aspect these are more important and may cause much ter ultimate loss than if they had died, because they have the er of transmitting B.W.D. to their offspring. If female chicks infected and recover, the organism locates itself in the ovary especially in some of the yolks of the eggs which will eventually aid when the bird reaches maturity. In this way is the disease nly spread. Fowls capable of transmitting B.W.D. by this hod are called " carriers." Young male chicks may also be cted and recover. The organism locates itself in the male

reproductive organs as well as in other tissues and there is stron
evidence to show that such male " carriers " may play an importa
part in the spread of B.W.D. All eggs laid by " carrier " hens d
not contain Bacillus pullorum and therefore all chicks from infecte
hens do not contract the disease. An infected hen may lay man
normal eggs which produce chicks, but sooner or later an infecte
egg is laid. The interval between the laying of infected eggs vari
greatly : this accounts for the fact that certain hatches bred fro
an infected flock may all be healthy, while in others the mortali
is very high. There is a diversity of opinion as to the hatchin
capability of infected eggs. It is probably the degree of infectio
which decides whether infected eggs will hatch out or whether th
developing chick will die in the egg before fully maturing. Th
chick hatched out from an infected egg is a grave source of dange
its general appearance is normal while all the time it is voidin
organisms in its excrement and so infecting many of the chick
hatched from normal clean eggs. Experiments show that very fe
organisms are required to infect healthy chicks. Infected chick
discharge fæces laden with infection and soil the food, litter etc
so that healthy chicks living in the same brooders etc., are bound
swallow many organisms and so become infected. Again, all infecte
chicks do not die, but continue to harbour the infecting organism
and in their turn lay infected eggs : thus the cycle of disease goes o

Contaminated litter may retain infection for a long tim
Experiments show that premises inhabited by chicks which hav
died of B.W.D. will be capable of infecting a healthy lot of chicks p
in many weeks after, the premises not having been cleansed meanwhil

Chicks usually do not become infected after they are about
week old. They may continue to die up to over a month old an
during the time elapsing between their infection and death th
continue to discharge infective excrement which may infect an
young chicks which pick it up. It will be seen from the foregoin
discussion that the chief sources of spread are the " carrier " he
the chicks produced from infected eggs and the chicks infected late

Problem of the " carrier " hen.

It is the " carrier " hen in the flock which keeps the disease goi
from year to year. No outward appearances will lead one to suppo
that a hen is a " carrier." Because of the ovary being infected
would be reasonable to suppose that " carriers " would be po
layers, but all poultry farmers do not agree on the point.
combat B.W.D. effectively it is highly important to know whi
of the breeding stock are " carriers." Happily, this can be don
and though the test applied may not give complete success on fi
application, it will go a long way to assist the farmer in his effo
to " clean up " his flock. The most important and satisfacto
test at the moment is the agglutination test. It consists roughly
mixing various dilutions of serum, obtained from the blood of hen
with a suspension of B. pullorum—the organism causing B.W.
and noting which dilution of serum, if any, causes a clumping
agglutinating of the organisms. The test can only be done in
laboratory and with adequate organisation many tests can be carri

n a short time. Most laboratories have their own special ods of carrying out the tests, and different workers have different ons as to their interpretation. Thus some hold that a positive on is got if dilutions of serum 1 in 50 or above causes agglutina- while if only lower dilutions, e.g., 1 in 25 cause agglutination, eaction is negative. It is highly probable that the reaction d be considered positive if a dilution of 1 in 25 causes clumping. test is certainly reliable and specific : it only needs some further rch to arrive at a definite conclusion as to which dilution of n should be taken as indicating a positive reaction. This mation should be forthcoming soon and in the meantime it is afest course to consider that agglutination at 1 in 25 indicates itive reaction. No test is infallible and there is a small percent- of " carrier " hens which will not react. Again, experiments shown that all " carrier " hens do not react to the same degree tested at various times : there are records of hens which have ed strongly, then have failed to react and eventually have ed again. It has also been shown that hens may fail to react not in lay and may react strongly when in full lay. These must be allowed for in the testing of any breeding stock and it d be advisable to carry out tests at least twice during any one ding season, allowing an interval of at least two months between ests. It has been shown in America that even one test during eeding season and the removal of all positive reacting hens will tly reduce the incidence of B.W.D. among chicks bred from the reactors. Experiments are being carried out in this country nd out how many years it is necessary to carry on testing before aranteed clean flock can be obtained. Poultry farmers must not lisappointed if some B.W.D. is still found after carrying out utination tests for one season : it may require several seasons re a completely clean flock is obtained, but the indications ay are that if they will persevere in testing for several years and d only from the non-reacting stock and their offspring, a clean k will be obtained. Even one year's testing with elimination of reactors will greatly reduce the losses and this test is apparently best course one can recommend at the present time. Cocks ld always be included in all tests as recent experiences show that may play a much greater part in the spread of B.W.D. than has erto been thought. Post-mortem examination of a " carrier " shows that some of the yolks in the ovary have undergone change : ead of being round, soft and yellow, they have become three- ered, hard, and dark in colour. These are the infected yolks ch may in time produce infected chicks.

Much experimental work is in progress at the moment to rtain how far the " carrier " hen is a source of danger to clean s and cocks. There is some evidence that the excrement of rriers " is infective, so when building up a clean flock it may be sable to remove the negative reacting stock to clean ground until time as the " carriers " have been disposed of and the old und cleaned by being turned up and limed.

Much has been written on the diagnosis of B.W.D. Pasting drooping of wings, light yellow liver, unabsorbed yolk, nodules

in the lungs, etc., have all been described as diagnostic of the disea
These may apply to any chick disease. The only sure method
diagnosing the disease is by the finding of the causal organism
the tissues, e.g. liver, lungs, etc., of the dead chick. This can o
be done in a laboratory and a few days must elapse between
receiving of the chick and the completion of the examination. T
disease should always be confirmed by a laboratory examinati
especially when it first makes its appearance, as there are other ch
diseases, not of a contagious nature. If the feeding and gene
management are thought to be good and there is a heavy mortal
among young chicks under one week old, B.W.D. should be suspec
and the disease should be treated as such while the laborat
examination is in progress.

How to deal with an outbreak of B.W.D.

Whether it is desirable to limit the infection among a hatch
chicks depends entirely on the purpose for which they are be
kept. If they are meant solely to replace breeding stock, it will
much better to let the disease run its course and sell the surviv
later for table purposes. The recovered chick is the real source
danger in that it may grow into a " carrier."

If it is desired to limit the disease and to save chicks, every s
chick should be destroyed and the remainder removed to cle
recently disinfected premises. No treatment of any kind can
any good because of the rapidity of spread, often before the hatch
the incubator is completed, nor can any drug prevent its spread.
very careful watch should be kept on the chicks, examinations bei
made several times a day to observe any chick that may appear si
It is very essential to remove such chicks, and it is much better
destroy them. The observation of chicks should be carried out
several days as an infected chick may not die at once but may l
on for a week or more before showing symptoms. Dead or destroy
chicks should be burned, and the person handling an infected hat
should not work among healthy hatches. The danger of spread
very great and the person handling diseased chicks plays a very l
part in spreading B.W.D., even though careful personal disinfecti
is carried out. It must also be borne in mind that only a sm
number of infecting organisms is necessary to infect young chic
and that infected premises can retain infection for many wee
This has been proved experimentally. After the removal of chi
from infected brooders, etc., careful cleansing is necessary bef
being used for a future hatch. Soap and water applied vigorou
will cleanse better than some disinfectants carelessly applied. T
much reliance is placed on the power of disinfectants to remo
infection : they must be applied thoroughly so that every part
the premises receives its share. Survivors of an infected ha
should always be treated as such and should not be grouped w
clean chicks, but should ultimately be used for table purposes.

B.W.D. can be controlled. Researches have pointed out
way and further results of experimental work will help still mo
The poultry farmer should take full advantage of these findings a
he will ultimately end up with a clean breeding flock.